ATX and microATX Board Gauge User Manual

Version 1.0

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Version 1.0, April 1998

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Revision History

Version 1.0	Initial release

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1. Introduction

1.1 Abstract

This document is a user/application manual for the ATX and microATX Board Gauge, Version 1.0. For more information and details about ordering the board gauge, see the microATX Web page at:

http://www.teleport.com/~microatx

The ATX Board Gauge is a "space model" that is intended as a tool to assist in mechanical evaluation, debug, and development of ATX and microATX-compliant PC chassis designs.

1.2 ATX/microATX Board Gauge Features

You can use the board gauge to do the following:

- Check for conformity to the ATX Motherboard Specification V2.01 or the microATX Motherboard Interface Specification V1.0.
- Install and remove height-gauge blocks to check violation of exclusion ("keepout") zones.
- Check the chassis I/O window position and dimensions by using the I/O window taper gauges.
- Check for ISA, PCI, and AGP add-in board compatibility.

The board gauge is the baseboard with or without extension and/or blocks added to create a space model. The gauge includes these components:

- Baseboard—The 9.6 inch (244mm) aluminum base plate represents a 9.6 inch × 9.6 inch (244mm × 244mm) microATX motherboard size.
  Color: green
- Extension piece—The 9.6 inch (244mm) × 2.4 inch (60.96mm) aluminum extension piece can be added to the baseboard to represent the full 9.6 inch (244mm) × 12 inch (305mm) ATX motherboard size.
  Color: red
- Removable blocks that represent various keepout zones in an ATX- or microATX-compliant design (as defined in the specifications)
  Color: most are blue; two are red
- Slide blocks—one block of 0.2 inch (5.08mm) thickness (required clearance) and one block of 0.7 inch (17.78mm) thickness (recommended clearance) to check clearance over Area A
- Two I/O window taper gauges that can be used to check the position and dimensions of the chassis I/O window
- Assortment of ISA, PCI, and AGP plug-in card connectors that enable checking the position of chassis expansion card guides and slots

You can adjust the components to meet the allowed motherboard sizes as defined by the microATX and ATX specifications. The gauge does not accommodate mini-ATX motherboard designs. The components are of robust, durable, and light-weight construction.

The removable blocks represent various keepout zones in an ATX- or microATX-compliant design (as defined in the specifications). Place the blocks to check for impingement on the keepout zones. Because the blocks are removable, it is possible to install the board gauge fully into the chassis under evaluation, even when impingement of one of the keepout zones occurs. Therefore, a full evaluation (checking all keepout zones) is not prevented even after the first violation occurs.

Use the two I/O window taper gauges to check the position and dimensions of the chassis I/O window. Use one taper gauge to check the vertical height and position, and use the other to check the horizontal width and position of the I/O window.

The board gauge has a (typical) assortment of ISA, PCI, and AGP plug-in card connectors that enable checking the position of chassis expansion card guides and slots.

2. Description

2.1 Baseboard and Extension Piece

Figure 1 shows the aluminum baseboard and extension piece. Table 1 describes the allowed microATX and ATX motherboard sizes.

Table 1: Possible ATX/microATX Motherboard Size Combinations

Motherboard size supported	Board gauge combination	Board and extension color	Use these keepout blocks
microATX	9.6 inches × 9.6 inches (244mm × 244mm) baseboard only	Green	Blue
ATX	9.6 inches × 9.6 inches (244mm × 244mm) baseboard plus 9.6 inch (244mm) × 2.4 inch (60.96mm) extension piece for total size of 9.6 inches (244mm) wide × 12 inches (305mm) long	Green Red	Blue plus the two red blocks

Color coding

- The baseboard has a green anodized coating.
- The extension piece has a red anodized coating.

This color scheme helps you use the correct keepout blocks (see later), depending on whether you are using the board gauge for ATX or microATX evaluation.

CAUTION

To minimize the risk of stripping the screw threads, do not overtighten the screws that are used to attach the extension piece to the baseboard.

Procedure

1. For full ATX size, fasten the extension piece to the baseboard, using the locator tongues and screws provided. The extension piece has a tongue that blocks two mounting holes on the baseboard. This tongue prevents the two holes from being used in the ATX space model. The two holes do not appear in ATX, although they are defined in the microATX specification and are needed in the gauge to represent the microATX model.
2. Use the lantern dowels provided to locate and retain the keepout blocks, whether you are setting up a microATX or ATX space model.

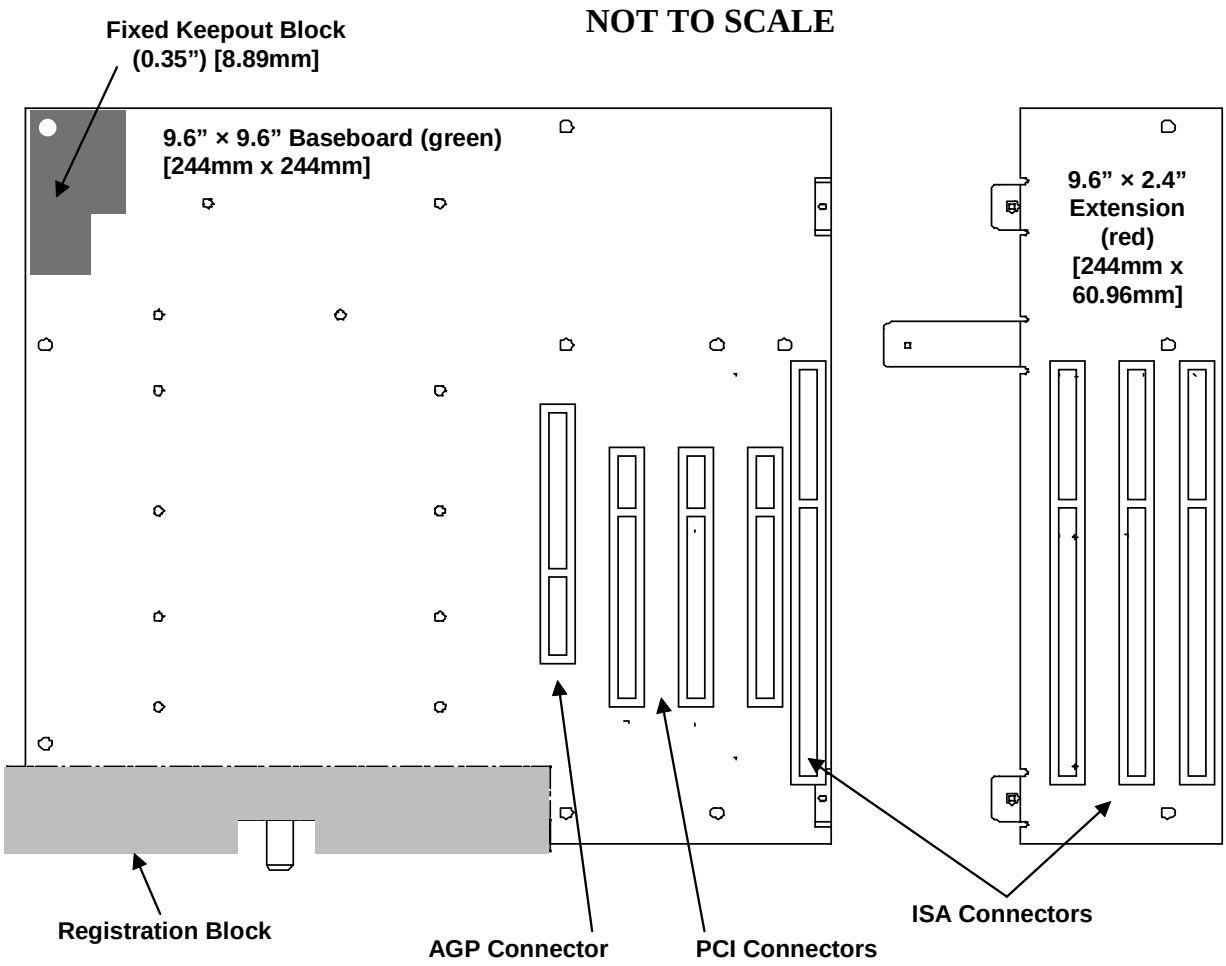

Figure 1: Baseboard and Extension Piece

2.1.1 Safety Warning

WARNING

When designs include a lithium power source (battery) on an ISA, PCI, or AGP add-in card, you must take special care to ensure that no power, from any source, is applied to any add-in card that is inserted into one of the connectors. The lithium battery could constitute an explosion hazard when the add-in card is plugged into one of the connectors on the board gauge.

Although the baseboard and extension piece are anodized, with a nonconductive coating, and the ISA, PCI, and AGP connectors are not intended to make electrical contact to the baseboards, it is possible for there to be low impedance paths between the pins of the connectors. Therefore, you must take care to ensure that no power (from any source) is applied to any ISA, PCI, or AGP add-in card that is inserted into one of the connectors.

2.2 Keepout Blocks

The keepout blocks are fabricated from a tough, light-weight, molded material. Fit the blocks to the baseboard to represent keepout zones as detailed in the ATX and microATX specifications. The blocks are keyed to fit in only the appropriate locations. Figure 2 shows locations by block height.

2.2.1 Alternative Keepout Areas

While the keepout areas for ATX and microATX are very similar, there are some slight differences in the areas covered. To allow for these differences, the board gauge has alternative components that you can use depending on whether you are using the gauge as an ATX or a microATX space model.

Color coding

The color-coded usage is as follows:

- microATX motherboard model: use all the BLUE keepout blocks. Do not use any of the red components (not the red extension board or the two red blocks).
- Full ATX motherboard model: add the RED extension board and use the two RED keepout blocks plus all the blue blocks.

2.2.2 Area A Required and Recommended Clearance

The keepout blocks for Area A are 2.8 inches (71.12mm) high. This height represents the maximum motherboard component height in this area (see “Height Constraints” section in the ATX and microATX specifications). The specifications state that this area has:

- **Required** clearance above the highest possible component of 0.2 inch (5.08mm)
- **Recommended** clearance above the highest possible component of 0.7 inch (17.78mm)

To help you check your model for clearance over Area A, the board gauge includes two slide blocks, one as thick as the required clearance and the other as thick as the recommended clearance.

Procedure

1. After installing the board gauge in the chassis under test, place one of the two slide blocks on top of the Area A keepout blocks.
2. Move the slide block over the top surface of the keepout blocks to check whether any part of the chassis impinges on the clearance above Area A.
3. Do the procedure with each slide block so you can check both the required and recommended clearances.

NOTE

If the **required** clearance is violated, then this problem MUST be corrected.
If the **recommended** clearance is violated, it should be corrected if possible.

NOT TO SCALE

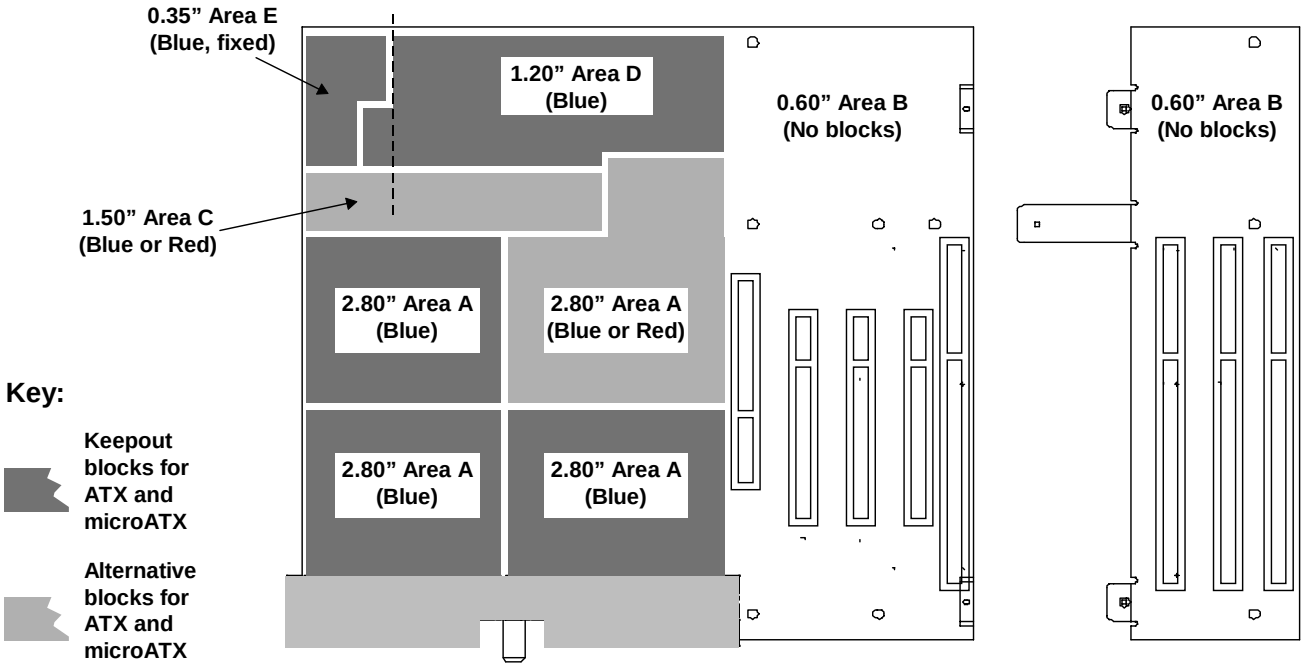

Figure 2: Keepout Block Location Diagram

Inch-metric equivalents for block heights given in Figure 2:

Area A 2.80 inches = 71.12mm

Area B 0.60 inches = 15.24mm

Area C 1.50 inches = 38.1mm

Area D 1.20 inches = 30.48mm

Area E 0.35 inches = 08.89mm

2.3 I/O Window Gauge

The board gauge includes an I/O window gauge for measuring the precise width and height of the chassis I/O window as well as the window's horizontal and vertical position (as defined in both specifications). Figure 3 shows the main components of the I/O window gauge:

- Registration block with locating dowel
- Width taper gauge
- Height taper gauge

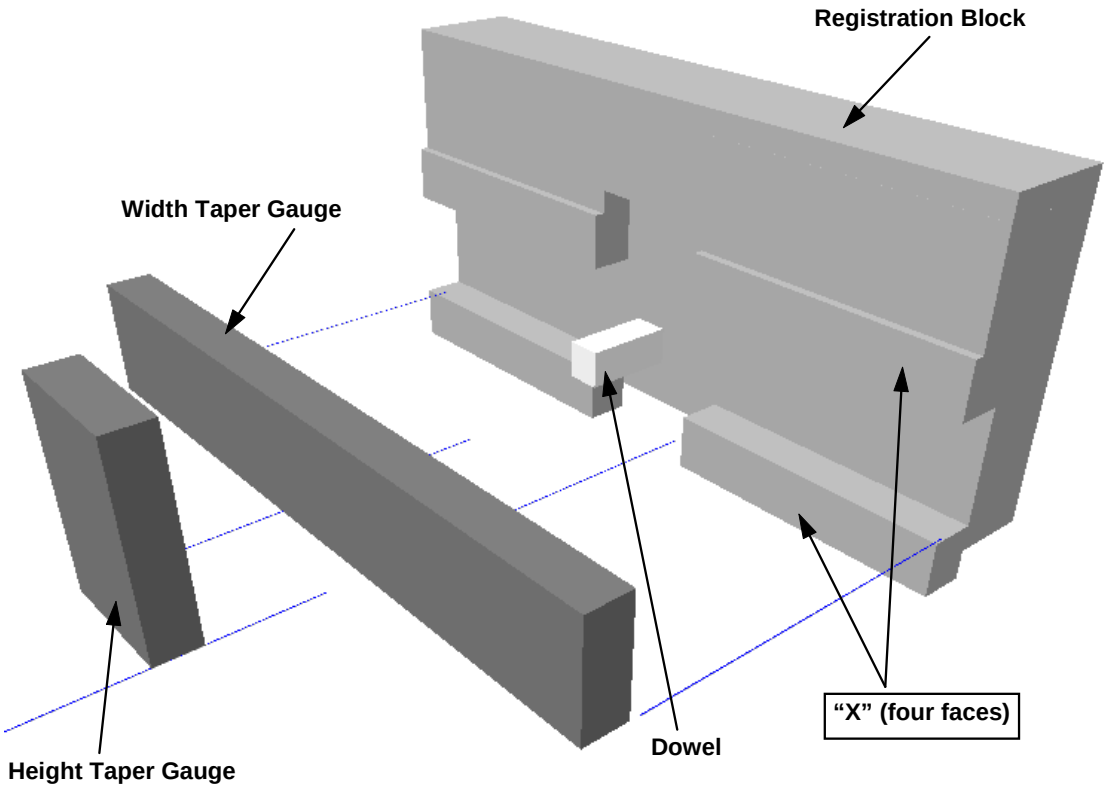

Figure 3: I/O Window Gauge Detail

2.3.1 Registration Block

The registration block is attached to the baseboard and is located precisely against the registration edges on the baseboard. The block has a Delrin† locating dowel fixed into it (Figure 3). You can use the dowel along with the taper gauges to check the precise position of the I/O window.

Procedure

1. Install the board gauge into the chassis under test. If the I/O window is the correct size and position, the registration block *should be in contact* with the chassis back panel, with the registration dowel protruding through the precise center of the I/O window.

2. Check the relationship between the motherboard mounting position and the chassis back panel. The metalwork immediately surrounding the I/O window should be *just* in contact with the protruding parts of the registration block (marked "X" in Figure 3).

Motherboard too near? If the registration block presses against the back panel so that you cannot install the board gauge and insert mounting screws (or other appropriate fixings) into the base of the chassis, the position of the motherboard will be too near the back panel.

Motherboard too far? If the clearance between the protruding sections of the registration block (X in Figure 3) is too great (>0.01 inch [0.25mm]), the motherboard mountings are positioned incorrectly, and the motherboard will be too far from the back panel.

2.3.2 I/O Window Keepout Zone

The I/O window is surrounded by a 0.1 inch (2.54mm) keepout zone on both the inside and outside faces of the chassis back panel. The protruding sections (X in Figure 3) of the registration block are precisely 0.1 inch (2.54mm) bigger than the defined I/O window. This difference lets you make a visual inspection to check that no chassis feature impinges on the keepout margin around the I/O window.

2.3.3 Taper Gauges

Use the two taper gauges to measure the I/O window. The width taper gauge checks both the horizontal position of the I/O window and the horizontal width. The height taper gauge checks both the vertical position of the window and the vertical height.

- Each taper gauge has a hole drilled through the center.
- Each taper gauge has three scribe marks around its circumference. The center scribe corresponds to the precise specified height or width of the window, while the two outer scribe marks indicate the maximum and minimum extents of the tolerance band (±0.008 inch [0.2mm

Procedure

1. Position a taper gauge with its center hole on the locating dowel in the registration block (Figure 3). It does not matter whether you start with the height or width taper gauge. Do the same steps for each one.
2. If the I/O window is of exactly the correct dimensions and position, you will be able to fit a taper gauge on the locating dowel and slide it along until you can push the taper gauge into the I/O window.
3. Using finger-force only, settle the taper gauge so that it rests in the I/O window.
4. To help with the registration of the taper gauges, you can loosen the motherboard mountings to allow the board gauge to float freely on the chassis base plate while you check the position of the I/O window.
5. When you slide the taper gauge (either the height or width gauge) into the I/O window so the gauge is parallel to the edge of the window, the gauge should stop with the edge of the window between the two outer scribe lines on the taper gauge.

Where the position of the window is incorrect (vertically and/or horizontally), you can still measure the height and width of the window, simply by fitting the taper gauges (one at a time) in the window without having the board gauge and registration block installed into the chassis.

2.4 ISA, PCI, and AGP Add-in Cards

The ATX and microATX specifications detail the locations for ISA and PCI expansion card connectors. The specifications do not stipulate which type of connector should be at each location. Any of the add-in card connectors can be ISA or PCI.

An AGP connector is not defined in the ATX specification, although the microATX specification details the AGP connector as occupying the same lateral location as any of the PCI connectors. In practice, however, where a motherboard supports AGP add-in cards, the AGP connector is placed nearest to the processor core. This is the left-most position according to Figure 1 and is often referred to as Slot 7.

The board gauge has a typical assortment of ISA, PCI, and AGP connectors. These are intended to make it easier to check the chassis for add-in card compatibility. After you have installed the board gauge in a chassis under test, you can plug any standard ISA, PCI, or AGP card into the appropriate connector. If the card guides and I/O bracket carrier are designed correctly, then the add-in card should seat correctly in the chassis.

Table 2: ISA, PCI, and AGP Connector Combinations

Motherboard size supported	Board gauge combination	Add-in cards supported
microATX	Baseboard only; blue keepout blocks.	1 × AGP 2 × PCI 1 × PCI or ISA
ATX	Baseboard plus extension piece; blue keepout blocks plus the two red alternative keepout blocks.	1 × AGP 2 × PCI 1 × PCI or ISA 3 × ISA

3. Parts List

Table 3 lists components or subassemblies of the board gauge. Although some of the items contain subcomponents, dismantling beyond the level detailed here is outside the scope of normal use.

Table 3: Board Gauge Parts List

Item	Quantity	Description
1	1	9.6 inch × 9.6 inch (244mm × 244mm) baseboard, 16 AWG aluminum alloy, green anodized (including dowels, 0.35 inch [8.89mm] height gauge block, registration block with Delrin locating dowel, AGP, 2 PCI, and 2 ISA connectors)
2	1	2.4 inch (60.96mm) extension piece, 16 AWG aluminum alloy, red anodized (including dowels and 3 ISA connectors)
3	4	Height gauge blocks (keepouts), various sizes, blue self color used to represent keepouts for ATX and microATX space models
4	2	Height gauge blocks (keepouts), various sizes, blue self color used to represent keepouts for microATX space model
5	2	Height gauge blocks (keepouts), various sizes, red self color used to represent keepouts for ATX space model
6	3	Mounting screws for 2.4 inch (60.96mm) extension piece
7	1	I/O window width taper gauge, aluminum alloy, hard chromium anodize.
8	1	I/O window height taper gauge, aluminum alloy, hard chromium anodize
9	1	0.2 inch slide block, white self color, used to check the **required** clearance over Area A (2.8 inch [71.12mm] keepout zone)
10	1	0.7 inch slide block, white self color, used to check the **recommended** clearance over Area A (2.8 inch [71.12mm] keepout zone)

4. Conversion Tables

EXAMPLES, how to use Tables 4 and 5

Use Table 4 to convert to millimeters to inches. In the example below, start with a value of 71.12mm and convert it to inches. You must divide the result by 1000, because Table 4 gives values in 1/1000 inch.

EXAMPLE Using Portion of Table 4: Millimeters (mm) to inches

mm	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000
0.000	0.00	39.37	78.74	118.11	157.48	196.85	236.22	275.59	314.96	354.33	393.70
0.025	0.98	40.35	79.72	119.09	158.46	197.83	237.20	276.57	315.94	355.31	394.69
0.050	1.97	41.34	80.71	120.08	159.45	198.82	238.19	277.56	316.93	356.30	395.67
0.075	2.95	42.32	81.69	121.06	160.43	199.80	239.17	278.54	317.91	357.28	396.65
0.100	3.94	43.31	82.68	122.05	161.42	200.79	240.16	279.53	318.90	358.27	397.64
0.125	4.92	44.29	83.66	123.03	162.40	201.77	241.14	280.51	319.88	359.25	398.62

Millimeters to inches (Table 4), starting with 71.12mm
10mm = 393.70; for 70mm, multiply by 7 = 2755.9
1mm = 39.37
0.125mm = 4.92
2755.9 + 39.37 + 4.92 = 2800.19 ÷ 1000 = **2.8 inches**

Use Table 5 to convert to inches to millimeters. In the example, below, start with a value of 2.8 inches and convert it to millimeters.

EXAMPLE Using Portion of Table 5: Inches to Millimeters (mm)

inch	0.0000	0.1000	0.2000	0.3000	0.4000	0.5000	0.6000	0.7000	0.8000	0.9000	1.0000
0.0000	0.00	2.54	5.08	7.62	10.16	12.70	15.24	17.78	20.32	22.86	25.40
0.0025	0.06	2.60	5.14	7.68	10.22	12.76	15.30	17.84	20.38	22.92	25.46

Inches to millimeters (Table 5), starting with 2.8 inches
1.0” = 25.40mm; for 2.0”, multiply by 2 = 50.80mm
0.8 “ = 20.32mm
2.8” = 50.80mm + 20.32mm = **71.12mm**

Table 4: Millimeters (mm) to Inches

mm	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000
0.000	0.00	39.37	78.74	118.11	157.48	196.85	236.22	275.59	314.96	354.33	393.70
0.025	0.98	40.35	79.72	119.09	158.46	197.83	237.20	276.57	315.94	355.31	394.69
0.050	1.97	41.34	80.71	120.08	159.45	198.82	238.19	277.56	316.93	356.30	395.67
0.075	2.95	42.32	81.69	121.06	160.43	199.80	239.17	278.54	317.91	357.28	396.65
0.100	3.94	43.31	82.68	122.05	161.42	200.79	240.16	279.53	318.90	358.27	397.64
0.125	4.92	44.29	83.66	123.03	162.40	201.77	241.14	280.51	319.88	359.25	398.62
0.150	5.91	45.28	84.65	124.02	163.39	202.76	242.13	281.50	320.87	360.24	399.61
0.175	6.89	46.26	85.63	125.00	164.37	203.74	243.11	282.48	321.85	361.22	400.59
0.200	7.87	47.24	86.61	125.98	165.35	204.72	244.09	283.46	322.83	362.20	401.57
0.225	8.86	48.23	87.60	126.97	166.34	205.71	245.08	284.45	323.82	363.19	402.56
0.250	9.84	49.21	88.58	127.95	167.32	206.69	246.06	285.43	324.80	364.17	403.54
0.275	10.83	50.20	89.57	128.94	168.31	207.68	247.05	286.42	325.79	365.16	404.53
0.300	11.81	51.18	90.55	129.92	169.29	208.66	248.03	287.40	326.77	366.14	405.51
0.325	12.80	52.17	91.54	130.91	170.28	209.65	249.02	288.39	327.76	367.13	406.50
0.350	13.78	53.15	92.52	131.89	171.26	210.63	250.00	289.37	328.74	368.11	407.48
0.375	14.76	54.13	93.50	132.87	172.24	211.61	250.98	290.35	329.72	369.09	408.46
0.400	15.75	55.12	94.49	133.86	173.23	212.60	251.97	291.34	330.71	370.08	409.45
0.425	16.73	56.10	95.47	134.84	174.21	213.58	252.95	292.32	331.69	371.06	410.43
0.450	17.72	57.09	96.46	135.83	175.20	214.57	253.94	293.31	332.68	372.05	411.42
0.475	18.70	58.07	97.44	136.81	176.18	215.55	254.92	294.29	333.66	373.03	412.40
0.500	19.69	59.06	98.43	137.80	177.17	216.54	255.91	295.28	334.65	374.02	413.39
0.525	20.67	60.04	99.41	138.78	178.15	217.52	256.89	296.26	335.63	375.00	414.37
0.550	21.65	61.02	100.39	139.76	179.13	218.50	257.87	297.24	336.61	375.98	415.35
0.575	22.64	62.01	101.38	140.75	180.12	219.49	258.86	298.23	337.60	376.97	416.34
0.600	23.62	62.99	102.36	141.73	181.10	220.47	259.84	299.21	338.58	377.95	417.32
0.625	24.61	63.98	103.35	142.72	182.09	221.46	260.83	300.20	339.57	378.94	418.31
0.650	25.59	64.96	104.33	143.70	183.07	222.44	261.81	301.18	340.55	379.92	419.29
0.675	26.57	65.94	105.31	144.69	184.06	223.43	262.80	302.17	341.54	380.91	420.28
0.700	27.56	66.93	106.30	145.67	185.04	224.41	263.78	303.15	342.52	381.89	421.26
0.725	28.54	67.91	107.28	146.65	186.02	225.39	264.76	304.13	343.50	382.87	422.24
0.750	29.53	68.90	108.27	147.64	187.01	226.38	265.75	305.12	344.49	383.86	423.23
0.775	30.51	69.88	109.25	148.62	187.99	227.36	266.73	306.10	345.47	384.84	424.21
0.800	31.50	70.87	110.24	149.61	188.98	228.35	267.72	307.09	346.46	385.83	425.20
0.825	32.48	71.85	111.22	150.59	189.96	229.33	268.70	308.07	347.44	386.81	426.18
0.850	33.46	72.83	112.20	151.57	190.94	230.31	269.69	309.06	348.43	387.80	427.17
0.875	34.45	73.82	113.19	152.56	191.93	231.30	270.67	310.04	349.41	388.78	428.15
0.900	35.43	74.80	114.17	153.54	192.91	232.28	271.65	311.02	350.39	389.76	429.13
0.925	36.42	75.79	115.16	154.53	193.90	233.27	272.64	312.01	351.38	390.75	430.12
0.950	37.40	76.77	116.14	155.51	194.88	234.25	273.62	312.99	352.36	391.73	431.10
0.975	38.39	77.76	117.13	156.50	195.87	235.24	274.61	313.98	353.35	392.72	432.09
	1/1000 inch										

Table 5: Inches to Millimeters (mm)

inch	0.0000	0.1000	0.2000	0.3000	0.4000	0.5000	0.6000	0.7000	0.8000	0.9000	1.0000
0.0000	0.00	2.54	5.08	7.62	10.16	12.70	15.24	17.78	20.32	22.86	25.40
0.0025	0.06	2.60	5.14	7.68	10.22	12.76	15.30	17.84	20.38	22.92	25.46
0.0050	0.13	2.67	5.21	7.75	10.29	12.83	15.37	17.91	20.45	22.99	25.53
0.0075	0.19	2.73	5.27	7.81	10.35	12.89	15.43	17.97	20.51	23.05	25.59
0.0100	0.25	2.79	5.33	7.87	10.41	12.95	15.49	18.03	20.57	23.11	25.65
0.0125	0.32	2.86	5.40	7.94	10.48	13.02	15.56	18.10	20.64	23.18	25.72
0.0150	0.38	2.92	5.46	8.00	10.54	13.08	15.62	18.16	20.70	23.24	25.78
0.0175	0.44	2.98	5.52	8.06	10.60	13.14	15.68	18.22	20.76	23.30	25.84
0.0200	0.51	3.05	5.59	8.13	10.67	13.21	15.75	18.29	20.83	23.37	25.91
0.0225	0.57	3.11	5.65	8.19	10.73	13.27	15.81	18.35	20.89	23.43	25.97
0.0250	0.64	3.18	5.72	8.26	10.80	13.34	15.88	18.42	20.96	23.50	26.04
0.0275	0.70	3.24	5.78	8.32	10.86	13.40	15.94	18.48	21.02	23.56	26.10
0.0300	0.76	3.30	5.84	8.38	10.92	13.46	16.00	18.54	21.08	23.62	26.16
0.0325	0.83	3.37	5.91	8.45	10.99	13.53	16.07	18.61	21.15	23.69	26.23
0.0350	0.89	3.43	5.97	8.51	11.05	13.59	16.13	18.67	21.21	23.75	26.29
0.0375	0.95	3.49	6.03	8.57	11.11	13.65	16.19	18.73	21.27	23.81	26.35
0.0400	1.02	3.56	6.10	8.64	11.18	13.72	16.26	18.80	21.34	23.88	26.42
0.0425	1.08	3.62	6.16	8.70	11.24	13.78	16.32	18.86	21.40	23.94	26.48
0.0450	1.14	3.68	6.22	8.76	11.30	13.84	16.38	18.92	21.46	24.00	26.54
0.0475	1.21	3.75	6.29	8.83	11.37	13.91	16.45	18.99	21.53	24.07	26.61
0.0500	1.27	3.81	6.35	8.89	11.43	13.97	16.51	19.05	21.59	24.13	26.67
0.0525	1.33	3.87	6.41	8.95	11.49	14.03	16.57	19.11	21.65	24.19	26.73
0.0550	1.40	3.94	6.48	9.02	11.56	14.10	16.64	19.18	21.72	24.26	26.80
0.0575	1.46	4.00	6.54	9.08	11.62	14.16	16.70	19.24	21.78	24.32	26.86
0.0600	1.52	4.06	6.60	9.14	11.68	14.22	16.76	19.30	21.84	24.38	26.92
0.0625	1.59	4.13	6.67	9.21	11.75	14.29	16.83	19.37	21.91	24.45	26.99
0.0650	1.65	4.19	6.73	9.27	11.81	14.35	16.89	19.43	21.97	24.51	27.05
0.0675	1.71	4.25	6.79	9.33	11.87	14.41	16.95	19.49	22.03	24.57	27.11
0.0700	1.78	4.32	6.86	9.40	11.94	14.48	17.02	19.56	22.10	24.64	27.18
0.0725	1.84	4.38	6.92	9.46	12.00	14.54	17.08	19.62	22.16	24.70	27.24
0.0750	1.91	4.45	6.99	9.53	12.07	14.61	17.15	19.69	22.23	24.77	27.31
0.0775	1.97	4.51	7.05	9.59	12.13	14.67	17.21	19.75	22.29	24.83	27.37
0.0800	2.03	4.57	7.11	9.65	12.19	14.73	17.27	19.81	22.35	24.89	27.43
0.0825	2.10	4.64	7.18	9.72	12.26	14.80	17.34	19.88	22.42	24.96	27.50
0.0850	2.16	4.70	7.24	9.78	12.32	14.86	17.40	19.94	22.48	25.02	27.56
0.0875	2.22	4.76	7.30	9.84	12.38	14.92	17.46	20.00	22.54	25.08	27.62
0.0900	2.29	4.83	7.37	9.91	12.45	14.99	17.53	20.07	22.61	25.15	27.69
0.0925	2.35	4.89	7.43	9.97	12.51	15.05	17.59	20.13	22.67	25.21	27.75
0.0950	2.41	4.95	7.49	10.03	12.57	15.11	17.65	20.19	22.73	25.27	27.81
0.0975	2.48	5.02	7.56	10.10	12.64	15.18	17.72	20.26	22.80	25.34	27.88
	mm										

5. Reference Documents

- ATX Motherboard Specification, Version 2.01
- microATX Motherboard Interface Specification, Version 1.0
- Design Guide for Intel ATX Motherboard I/O Implementations
- microATX System Design Suggestions
- microATX EMC Design Suggestions
- ATX Web site: *http://www.teleport.com/~atx/*
- microATX Web site: *http://www.teleport.com/~microatx/*

6. Suggested Test Plan

Download the microATX Chassis Checklist from:

http://www.teleport.com/~microatx

Table 6 summarizes the relevant sizes or clearances for gauge components. Following the table, there is a blank test log that you can use in conjunction with the chassis checklist.

Table 6: Gauge Dimension Summary

Component	Fig.	Relevant dimension, size	Clearance
For microATX: aluminum base plate	1	9.6 inch × 9.6 inch (244mm × 244mm)	n/a
Extension piece	1	9.6 inch (244mm) × 2.4 inch (60.96mm)	n/a
For ATX: aluminum base plate plus extension piece	1	9.6 inch (244mm) × 12.0 inch (305mm)	n/a
Width and height taper gauges to check I/O window	3	Scribe marks: Center = precise height or width of window Outer marks = max/min extents of tolerance band	Tolerance band = ±0.008 inch (0.2mm)
Keepout blocks for Area A	2	2.8 inches (71.12mm) high	Required 0.2 inch (5.08mm) Recommended 0.7 inch (17.78mm)
Slide block to check **required** clearance over Area A	n/a	0.2 inch (5.08mm) thickness	Required 0.2 inch (5.08mm)
Slide block to check **recommended** clearance over Area A	n/a	0.7 inch (17.78mm) thickness	Recommended 0.7 inch (17.78mm)
Registration block, clearance between protruding sections of block	3	0.1 inch (2.54mm) bigger than the defined I/O window	Must not be greater than 0.01 inch [0.25mm]
I/O window keepout zone	3	0.1 inch (2.54mm) keepout zone on both the inside and outside faces of the chassis back panel	

Test Log

Test Log	Tested By:	
	Date:	
	Location:	
UUT Chassis Details	Manufacturer:	
	Chassis Type:	
	Model/Part Number:	
	Revision:	
	Serial Number:	
	Number & type of drive bays:	3½" ext:
		5¼" ext:
		3½" int:
		5¼" int:
	Notes:	
Board Gauge Details	Serial Number:	
	Revision Number:	
	ATX Specification Revision:	
	microATX Specification Revision:	

Pass/Fail Comments

	microATX board **9.6 inches × 9.6 inches (244mm × 244mm)**	**ATX board** **9.6 inches (244mm) wide × 12 inches (305mm) long**
Keepout Zones		
I/O Window		